

Algebra II Trig Review 12.4 – 12.6

Name Key

I. Find the range and mean deviation for each data set. 1 decimal place.

1. 15, 12, 24, 30, 11, 16, 20, 8

range: $30 - 8 = 22$

mean: $\bar{x} = 17$

$$\sum |x_i - \bar{x}| = 2 + 5 + 7 + 13 + 6 + 1 + 3 + 9 = \frac{46}{8} = 5.75$$

II. Find the variance and standard deviation for each data set. 1 decimal place.

2. 42, 57, 31, 52, 49, 32, 43, 42 $\bar{x} = 43.5$

$$\sum (x_i - \bar{x})^2 = 2.25 + 182.25 + 156.25 + 72.25 + 30.25 + 132.25 + 0.25 + 2.25 = 578$$

$$\frac{578}{8} = 72.25 \sigma^2$$

$$\sigma = \sqrt{72.25} = 8.5$$

3. 16, -9, 5, -12, 8, -2, -4, -3 $\bar{x} = -0.125$

$$\sum (x_i - \bar{x})^2 = 260 + 80.8 + 25.1 + 143.7 + 64.2 + 4 + 15.9 + 8.9 = 602.6$$

$$\sigma^2 = \frac{602.6}{8} = 75.325$$

$$\sigma = \sqrt{75.325} = 8.7$$

4. The approximate percentages of women in the work force are given in the table below. One decimal place.

Year	70	75	80	85	90	95	00
%	45	46	49	51	55	58	60

Find the following: Mean 52%

$$\frac{364}{7}$$

Median 51%

middle

Range 15%

60-45

Mean deviation 4.9%

$$\frac{7+6+3+1+3+6+8}{7}$$

Standard deviation 5.4%

σ

IV. Binomial Distributions

A coin is flipped n 8 times. Find the probability of each event. Tenth of a percent.

5. Exactly 5 are heads. 0.219 = 21.9%

$$P = {}_8C_5 (.5)^5 (.5)^3$$

6. At least 7 are tails 3.52%

$$P(7 \text{ or } 8) = {}_8C_7 (.5)^8 + {}_8C_8 (.5)^8$$

$$0.03125 + 0.00391$$

$$0.0352$$

$$3.52\%$$

At one University, the probability that a student will graduate in five years is 40%. Find the probability of each event for a sample of 10 students.

7. Exactly 5 will graduate. $\frac{{}^{10}C_5 (.40)^5 (.60)^5}{1} = 20.1\%$ 8. At least 8 will graduate. $\frac{P(8 \text{ or } 9 \text{ or } 10)}{1} = 1.2\%$
 ${}^{10}C_8 (.40)^8 (.60)^2 + {}^{10}C_9 (.40)^9 (.60)^1 + {}^{10}C_{10} (.40)^{10}$
 $0.0106 + 0.0016 + 1.05 \times 10^{-4}$

Find the probability that a basketball player with the following free throw percentages will make 8 out of 10 free throws.

9. 70% $\frac{{}^{10}C_8 (.7)^8 (.3)^2}{45} = 23.3\%$ 10. 90% $\frac{{}^{10}C_8 (.9)^8 (.1)^2}{1} = 19.4\%$ 11. 54% $\frac{{}^{10}C_8 (.54)^8 (.46)^2}{1} = 6.9\%$

V. Normal Distributions

Let x be a random variable with a standard normal distribution. Use the area table to find each probability.

x	0	.2	.4	.6	.8	1	1.2	1.4	1.6	1.8	2
A(x)	0	.0793	.1554	.2257	.2881	.3413	.3849	.4192	.4452	.4641	.4772

12. $P(x \geq -0.2)$ $\frac{0.5 + 0.0793}{P(0.2)} = 0.5793$ 13. $P(x \geq 0.4)$ $\frac{.5 - P(0 \leq x \leq 0.4)}{.5 - 0.1554} = 0.3446$ 14. $P(-0.4 \leq x \leq 0.6)$ $\frac{P(-.4 \leq x \leq 0) + P(0 \leq x \leq .6)}{.1554 + .2257} = 0.3811$

The weight of a box of cereal are normally distributed with a mean of 12.2 ounces and a standard deviation of 0.3 ounces. Find the probability of each event.

15. A box weighs less than 11.9 ounces $\frac{14 + 2}{14 + 2} = 16\%$

16. A box weighs more than 11.6 ounces $\frac{98\%}{1 - 2\%} = 98\%$

17. A box weighs between 11.9 and 12.8 ounces $\frac{34 + 34 + 14}{34 + 34 + 14} = 82\%$

18. A box weighs more than 12.8 ounces $\frac{2\%}{2\%} = 2\%$

